

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CONTOUR FARMING
(acre)
CODE 330

DEFINITION

Tillage, planting, and other farming operations performed on or near the contour of the field slope.

PURPOSES

1. To reduce sheet and rill erosion.
2. To reduce transport of sediment and other water-borne contaminants.

CONDITION WHERE PRACTICE APPLIES

This practice applies on sloping land where crops are grown. Contour farming is most effective on slopes between 2 and 10 percent. This practice will be less effective in achieving the stated purpose(s) on slopes exceeding 10 percent and in areas with 10-year-frequency, single storm EI values greater than 140 (EI = total storm energy times the maximum 30-minute intensity). The practice is not well suited to rolling topography having a high degree of slope irregularity because of the difficulty meeting row grade criteria.

CRITERIA

General Criteria Applicable to All Purposes

Minimum Row Grade

1. Row grades for soils with slow to very slow infiltration rates (soil hydrologic groups C or D), or for crops sensitive to ponded water conditions for periods of less than 48 hours, shall be designed with positive row drainage of not less than 0.2 percent on slopes where ponding is a concern.

Maximum Row Grade

1. The row grade shall be aligned as closely as possible to the contour to achieve the greatest erosion reduction. The maximum grade of rows shall not exceed 2 percent or one half of the up and down hill slope percent used for erosion prediction, whichever is less.
2. Up to 3 percent row grade may be permitted within 150 feet of the approach to a *grassed waterway*, *field border* or other stable outlet.
3. Headlands or end rows that are steeper than the maximum row grade criteria stated above shall have a cover-management condition no greater than 3 or established to permanent field borders. [Cover-Management Conditions are described in Chapter 6, *Predicting Soil Erosion by Water, A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)*. 1997. USDA Agricultural Research Service, Agricultural Handbook No. 703].
4. When the row grade reaches the maximum allowable design grade, a new baseline shall be established up or down slope from the last contour line and used for layout of the next contour pattern. All tillage and planting operations will follow the contour line established.

Minimum Ridge Height

1. The ridge height shall be designed to reduce soil erosion compared to that of rows oriented up and down the slope. As a minimum, this practice shall be designed to achieve a 0.5-2 inch ridge height during the period of the rotation that is most vulnerable to soil erosion (Springtime). Ridge height design will be determined using on site conditions and current erosion prediction technology approved for use.
2. The minimum ridge height criteria is not required for close-grown crops, such as small grains, when runoff is reduced compared to that of rows planted up and down the slope. As a minimum, plant height shall be at least 6 inches high and the spacing between plants within the row shall not be greater than 2 inches.
3. The minimum ridge height criteria is not required where the practice *residue management, no-till/strip-till* is used on the contour if at least 50 percent surface residue is present between the rows after planting.

Critical Slope Length

1. A contour farming layout shall not occur on a hill slope that is longer than the critical slope length, unless supported by other practices (e.g., *terraces, diversions*) that either reduce slope length below the critical length or reduce overland flow velocities. Increasing residue cover and roughness will change the vegetative cover-management conditions and decrease overland flow velocities. Increasing roughness alone is not sufficient to reduce the critical slope length.
2. The computation of critical slope length shall be determined using approved erosion prediction technology.

Stable Outlets

1. All runoff from contouring shall be delivered to stable outlets, such as *grassed waterways, field borders, water and sediment control basins, or underground outlets for terraces and diversions*.

CONSIDERATIONS

1. Prior to design and layout, obstruction removal and changes in field boundaries or shape should be considered, where feasible, to improve the effectiveness of the practice and the ease of performing farming operations.
2. If using *residue management, ridge-till* on the contour, avoid crossing over ridged rows at correction areas. Consider sod turn strips if correction areas are unavoidable.
3. Ridge height may vary throughout the year as a result of tillage, planting, some harvest operations, hilling, row cultivation, and weathering. Use of the variable ridge height may be needed in some areas.
4. The width of correction areas, and the distance between baselines, should be adjusted for equipment operation widths.
5. *Grassed waterways, water and sediment control basins, underground outlets*, or other suitable practices should be used to protect areas of existing or potential concentrated flow erosion.
6. There are several factors that impact the effectiveness of contour farming to reduce soil erosion. These factors include: 10-year storm EI_{10} value, ridge height, furrow grade, slope steepness, soil hydrologic group, cover and roughness, and the critical slope length. Cover and roughness, row

grade, and ridge height can be influenced by management and provide more or less benefit depending on design.

7. *Contour farming* may need to be used in combination with other conservation practices to meet the goals of the conservation management system.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation. The minimum documentation for this practice is found on the last page of the standard.

OPERATION AND MAINTENANCE

1. Perform all tillage and planting operations parallel to contour baselines or *terraces, diversions, or contour buffer strip* boundaries where these practices are used, provided the applicable row grade criteria are met.
2. Where *terraces, diversions, or contour buffer strips* are not present, maintain contour markers on grades that, when followed during establishment of each crop, will maintain crop rows at designed grades. Contour markers may be field boundaries, a crop row left untilled near or on an original contour baseline, or other readily identifiable, continuous, lasting marker. All tillage and planting operations shall be parallel to the established marker. If a marker is lost, re-establish a contour baseline within the applicable criteria set forth by this standard prior to seedbed preparation for the next crop.
3. Farming operations should begin on the contour baselines and proceed both up and down the slope in a parallel pattern until patterns meet. Where field operations begin to converge between two non-parallel contour baselines, establish a correction area that is either permanently in sod, established to an annual close-grown crop, or is in cover-management condition 3.
4. Where contour row curvature becomes too sharp to keep machinery aligned with rows during field operations, establish sod turn strips on sharp ridge points or other odd areas as needed.
5. Renovate *field borders* as needed to maintain at least 65 percent ground cover. Maintain adequate field border width to allow farm implements room to turn.

REFERENCES

National Contouring Standard (330) February 2000
USDA Agricultural Research Service, Agricultural Handbook No. 703
Jobsheet 330

Practice Documentation For: <i>Contouring Farming - 330</i>
The following documentation must be in the case folder or engineering subfolder.
Practice Planning
<ol style="list-style-type: none"> 1. Is the practice part of a conservation plan? 2. Have the purpose(s) for the practice been identified? 3. Is the location of the practice identified on a map or plan drawing?
Practice Design
<p>Have the following design criteria been addressed?</p> <ol style="list-style-type: none"> 1. The minimum row grade to be compatible with the soil hydrologic group. 2. The maximum row grade to achieve erosion control. 3. Locating and staking the contour baseline(s). 4. Management of the headlands in the proper cover condition. 5. Minimum ridge height. 6. Critical slope lengths. 7. Considerations and plans for stable outlets.
Practice Installation / Application
Does the practice meet the minimum criteria for the planned purpose(s)?
<p>Have the following criteria been documented in the assistance notes or practice jobsheet?</p> <ol style="list-style-type: none"> 1. Minimum and maximum row grades established. 2. Acres established on the contour.
Practice Deficiencies
If applicable, have the practice deficiencies been communicated with the decisionmaker?
Practice Maintenance
<p>Have the following maintenance actions been communicated to the decisionmaker?</p> <ol style="list-style-type: none"> 1. Perform all tillage and planting operations parallel to contour baselines <i>diversions, or contour buffer strip</i> boundaries where these practices are used, provided the applicable row grade criteria are met. 2. Where <i>diversions, or contour buffer strips</i> are not present, maintain contour markers on grades that, when followed during establishment of each crop, will maintain crop rows at designed grades. Contour markers may be field boundaries, a crop row left untilled near or on an original contour baseline, or other readily identifiable, continuous, lasting marker. All tillage and planting operations shall be parallel to the established marker. If a marker is lost, re-establish a contour baseline within the applicable criteria set forth by this standard prior to seedbed preparation for the next crop. 3. Farming operations should begin on the contour baselines and proceed both up and down the slope in a parallel pattern until patterns meet. Where field operations begin to converge between two non-parallel contour baselines, establish a correction area that is either permanently in sod, established to an annual close-grown crop, or is in cover-management condition 3. 4. Where contour row curvature becomes too sharp to keep machinery aligned with rows during field operations, establish sod turn strips on sharp ridge points or other odd areas as needed. 5. Renovate <i>field borders</i> as needed to maintain at least 65 percent ground cover. Maintain adequate field border width to allow farm implements room to turn.
Other Comments: